GARDEN AND FOREST.

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The Use of Arbor Day.

THE establishment of Arbor Day in so many of the States of our country is frequently referred to, by persons who write and talk about forestry, as an evidence or instance of a great advance in popular interest and intelligence regarding this subject. But unless more serious and intelligent attention is given to the use to be made of it, and to the character of the proceedings connected with it, the day will not long be observed. Addresses by persons who have no real knowledge of trees, or of their relations to the welfare of a community, are likely to have a tiresome similarity and monotony of character. When the novelty of Arbor Day observances has passed away they will soon cease to attract attention or awaken interest among intelligent people, unless in each town a few persons care enough about the matter to give to it the time, thought and labor required to make the day of some practical value. The reports of Arbor Day observances which come to us from some places indicate that the talk and ceremonies sometimes border closely on the farcical and ridiculous. In such cases it is necessary to remember that tree-planting in villages is not forestry, is no part of it, indeed, and has no direct relation to it.

The subject of forestry is, of course, an appropriate one for Arbor Day, if there is any person available who is competent to present or discuss it. Almost any time would be suitable for the intelligent treatment of this topic, if people will come together to hear and consider it. It is vitally related to the public welfare in a variety of ways, and serious injury to the prosperity and civilization of our country is almost certain to result from the lack of sufficient knowledge to enable our people justly to estimate its importance. Oratory without knowledge is of little value, and will not long be found entertaining; but knowledge regarding the subjects which are appropriate for Arbor Day can be acquired only as knowledge of other important subjects is acquired, by serious interest and application, by study and adequate observation.

The planting of trees by a person able to use it as an object-lesson for popular instruction by describing the structure and functions of the various parts of the tree, and their relation to each other in its life would in many places be an admirable use to make of Arbor Day. The proper care of trees and shrubs in villages and along country road-sides, their economic value as related to bird-life and insect-life, their influence on health, and on the interest and happiness of human life, their value as a means of seclusion, and their effect in landscape everywhere, are all good subjects for consideration on Arbor Day, if they are seriously and intelligently presented.

If a few public-spirited young men and women in every town will read the new literature regarding these and similar subjects, they will soon be able to supply competent direction for Arbor Day observances, and, what is more important, to give good counsel, and to act intelligently when questions of pruning trees, widening streets and destroying road-sides are under discussion. We observe that in some towns which last year celebrated Arbor Day with much sentimental oratory many fine trees have since been unintelligently and barbarously slaughtered, and the beauty of charming banks and road-sides has been needlessly destroyed forever.

It is pleasant to be able to state that Nicholson's "Dictionary of Gardening" has been completed. The author, by his attainments and his position, was admirably fitted for the task; and he has produced a work which is an invaluable aid to every cultivator and every writer about plants. A work of this character necessarily soon gets out of date, and some arrangement, it is to be hoped, will be made which will enable the author and his publisher to produce, every few years, a supplement. We cordially indorse the plea of the *Gardeners' Chronicle* for the loyal adoption by horticulturists of the names of plants employed in the Dictionary, not because they are always correct, but because a standard international nomenclature of cultivated plants is now greatly needed, and this work is the best standard available for general use. In this connection we cannot do better than to reproduce, from our English contemporary, the following: "We do not mean to deny the right of any one to put whatever names he likes to his plants, so long as he does not publish them, but if he does so, then he should either use English names, concerning the value of which there can be no doubt, or, at any rate, he should not employ such names as by their construction imply that plants have been properly described and registered by a competent botanist. Half the difficulty in nomenclature is caused by the unauthorized use of names botanical in appearance, but purely horticultural or commercial in substance." Every nursery catalogue is filled with names of this character. Every year hundreds of new ones are made in half the States of the Union and in every country of Europe, and the mysteries of the nomenclature of garden plants are well-nigh unfathomable. The coiners of names themselves begin to appreciate the difficulties with which they are investing the successful practice of horticulture, and the time, perhaps, is not far distant when the various associations of nurserymen and of florists will take the steps necessary for a real reform in this matter. They can hardly do it too soon.

Senate Bill number 354, intended to prevent the construction of railroads across state lands in the Forest Preserve of this state, was so amended in the Senate before its passage as entirely to destroy its practical force and value. As passed it excludes only railroads not yet chartered, and as the real danger to the Adirondack forests is from railroads already chartered, the bill in its present shape is worthless. Its original character should be restored; it should be introduced in the Assembly and urged to its passage. Then it should be passed by the Senate and made a law. It is an important measure, as we have before pointed out. Its consideration rightly brings up the general subject of the value of the Adirondack forests to the people of this state, and the present is an appropriate

time for the discussion of this topic in all its aspects and relations. The press of the state, and of the country in general, can render most vital aid in pressing the matter upon the attention of the Legislature and of the people.

If the railroads which already penetrate the Adirondack region are extended across state lands through the Forest Preserve, nearly all the timber of the wilderness will be made easily accessible, and can be readily conveyed to market. It will be rapidly cut off, and as much of the soil will be destroyed by repeated burning, the forest will not be speedily reproduced, or only trees of very inferior quality will grow.

The people of the state should consider the subject intelligently and fully before they decide to permit the railroads to be extended across lands belonging to the state into those portions of the forest which are at present inaccessible. The permanent value of the great waterways of the state of New York depends in large measure upon the maintenance of forest conditions on the mountain slopes around the sources of streams and along their upper course. The varied attractions and interests of the region as a sanitarium, as a place of resort for rest and recreation, are all now menaced by the most serious danger which has ever threatened them. If the railroads are extended the region will be robbed of all the features which now make it of value to visitors and to the people of the state in general, and its attractiveness cannot be restored until centuries have passed away. It would be a most wise and practical step forward—a real advance in civilization—if the people should determine that the forests of the state lands shall be protected from further encroachment and injury, and especially that right of way across them shall not, under any circumstances, be granted to railroads.

Easter Flowers.

FOR generations the white Lily has been the accepted symbol of innocence. Purity is expressed by its aspect more plainly than any other quality is expressed by any other flower—not the shrinking, timid kind of delicacy which avoids even the gaze of criticising eyes, but the fearless dignity of an innocence that is too well assured of its spotless strength to be afraid of comment. References to the Lily as the type of innocence are scattered thickly through mediæval as well as modern poetry, and the force of the association is well shown in a belief which still persists in some of the rural districts of Germany that if a person be unjustly executed Lilies will spring up on his grave. It is easy to see, therefore, why the Lily, usually conceived as our common garden species (*Lilium candidum*), became the most familiar attribute of the Virgin Mary. Many other flowers were dedicated to her, and among them, of course, the Rose. But the Lily, above all, is the Virgin's flower. Very early pictures, like many of later date, portray her with a vase of Lilies by her side. There are usually three blossoms, each borne on a separate tall and slender stalk; and in the number we may divine, perhaps, a reference to the doctrine of the Trinity. The earliest pictures of the Annunciation show the Angel Gabriel bearing either a sceptre or a branch of Olive; but a Lily-wand soon took their place in his hand, and in the great period of the Renaissance, as well as in modern times, it is rare to find him pictured in a different way.

To-day in Protestant lands the Lily is chiefly associated with the festival of Easter. But if we accept the evidence in popular works on flower-lore, its connection with this special festival cannot be of very early date. Many flowers were recognized as Easter flowers. Among them was the purple Anemone (*Anemone pulsatilla*), which thus gained the name of "Pasque-flower," the white Broom and all white blossoms in general, and a so-called Easter-Lily or Lent Lily. But this last was not, as many readers of English books have doubtless believed, the common white Lily or, indeed, a Lily of any kind. It was the common yellow Daffodil, which is still often called "Easter-Lily" in England.

Many local European customs which now have a Christian significance, or are supposed to embalm such a significance long-ago forgotten, are in truth survivals of old pagan rites which incorporated themselves with the new faith in ancient days—either with the discreet connivance or in despite of the most conscientious efforts of the missionaries of Rome. Some such customs are still connected with Easter-tide. In Bavaria the peasants on Easter Day make garlands of Coltsfoot and throw them into the fire; in the district of Lechrain (we read in Dyer's "Folk-lore") a sacred fire is lighted at Easter and every household brings to it a Walnut branch, "which, when partially burned, is laid on the hearth fire during tempests as a protection charm against lightning. . . . In Bareuth young girls go to a fountain silently, and, taking care to escape notice, throw into the water little Willow rings with their friends' names inscribed thereon; the person whose ring sinks quickest being the first to die."

Of course such customs as these have no existence in our country; but the use of flowers at Easter to decorate the church, to prove remembrance at the grave, and even to serve as gifts to living friends, is yearly becoming more general. There is no anniversary, indeed, when the use of flowers seems so appropriate as at Easter. Their blooming presence typifies the new birth of the year, and this in its turn the resurrection of Christ. Many flowers are employed in America for Easter purposes, but white ones chiefly, and, more than all, the white Lilies; and it is not strange, therefore, that the old name of "Easter-Lily," so long appropriated by the yellow Daffodil, should now be given to these flowers.

To Make a Lawn.

A SWARD thickly and evenly set with the finer grasses, cropped or cut so close as to reveal every undulation in the surface of the land and so smooth and even that the shadows of trees and shrubs as they rest upon it are clearly outlined—this is the foundation element of beauty in home grounds where grass will thrive. The lack of green sward is one of the most serious difficulties encountered by the landscape-gardener in regions like California, where there is a dry season, and in the South, where the grasses are coarse and rank. Even in the most favored parts of the United States our hot summers too often leave a lawn scorched brown, as if it had been burned over. Grass must have moist feeding-ground, and this means a deep and fertile soil. Good drainage is, therefore, essential, as it keeps the land from saturation in wet weather, and hard baking when the rains cease, and in place of these extremes preserves the moist condition most favorable for roots. Good drainage insures for roots more feeding room and more food. It allows air to penetrate the soil and makes it warmer, encourages the grass to an earlier start in spring, helps it to grow later in autumn and lessens the danger of heaving by frost.

Deep trenching is too expensive for large lawns, but at the outset they should be deeply tilled, with fine, well-rotted stable manure thoroughly incorporated with the soil; on land of ordinary fertility forty or fifty loads to the acre are recommended. If this is done in spring the land should be deeply harrowed, over and over, not only to make a fine seed-bed but to compact the soil, which has not had time to settle, and bring the particles closely and firmly together. After thorough harrowing the surface should be rolled and again lightly harrowed, when the seed can be sown, brushed in and rolled again. This is best done in April in this latitude, although seed can be successfully sown in early September if seasonable rains follow.

For a small lawn, it is preferable to use sod from an old pasture. These sods will contain the most persistent and finest grasses, which have survived the trampling of sheep and cattle and developed under close cropping into just such a turf as is desired. Sodding is too expensive, however, for lawns of any extent, and if seed is sown the best and purest should be selected. The so-called "lawn mixtures" cannot be recommended. Professor Beal, of the Michigan Agricultural College, published a few years ago the results of a careful analysis of several of these mixtures. In the best of them the great bulk of the seeds were of Blue Grass and Red Top, but they cost in the mixture two or three times as much as when purchased alone. Some of these mixtures, besides the seed of weeds, contained the seeds of Orchard Grass, which is coarse and bunchy; Perennial Rye Grass, which takes the best food of the soil for a few years and then dies out; Sheep's Fescue and Hard Fescue, which grow in tufts; Red and Pea-vine Clover, which are coarse and short-lived; Italian Rye Grass, which will perish the first winter; Hair Grass, which is a feeble grower, and other varieties altogether unsuitable for the lawn. Manufacturers of standard fertilizers give a guaranteed analysis of the amounts of the different elements of plant-food they contain. Until the venders of Lawn Grass mixtures give the same guarantee of the composition of their wares, buyers have no means of knowing what kind of seed they will sow or what prices they pay for each kind.

Kentucky Blue Grass (*Poa pratensis*) is one of the most common grasses in the north temperate zone, and its spread-

ing root-stocks fill the ground near the surface. It is a perennial, tenacious of life, starts quickly after cutting and in the spring, but does not become thoroughly established before the third year after sowing. Altogether it is the best grass for a lawn, and next to it comes Rhode Island Bent (*Agrostis canina*), which is rather finer than Red Top (*Agrostis vulgaris*, var. *alba*). It will thrive on thinner soils than will Blue Grass, and becomes fairly well established the first year. It is the best grass to mix in quantity with Blue Grass. If in chaff, two bushels of the Bent seed mixed with the same amount of Blue Grass seed should be sown to the acre.

A lawn thoroughly made will last for years, and, if properly cared for, will improve with age. Cut often and leave the clippings on the ground. Give a sprinkling of seed each spring, followed by a heavy rolling while the ground is soft, to fit the surface for the mower, and pack the soil about the roots where frost has loosened them. A dressing of fine compost, or of some complete commercial fertilizer, should be added.

Foreign Correspondence.

London Letter.

WHEN the history of English horticulture in the nineteenth century comes to be written its most remarkable feature will be the position held by the great Orchid family. In a period of less than fifty years the cultivation of Orchids has developed into almost a passion, and has become an important commercial industry. There are millions of pounds invested in Orchids in England alone. Collectors are in all parts of the world searching for them. They are objects of interest to all classes of the community. Society journals open their pages to long articles upon them, and all sorts of anecdotes about them, sometimes true and often fictitious, are told and listened to by all kinds of people. There are a few horticulturists who profess to despise Orchids, and who constantly discover that a reaction against them is setting in. But these plants are more popular now than ever, and this popularity seems on the increase. And yet there is no Orchid Society in England. Such plants as Chrysanthemums, Carnations, Auriculas and Roses have each their own society. Weak efforts to start an Orchid Society have been made, but they came to nothing. There is, however, special representation promised for Orchids now, the Royal Horticultural Society having decided to appoint a committee of specialists to adjudicate on Orchids alone. That such a committee is wanted is abundantly evident. The number of men who possess a knowledge sufficient to enable them to decide which Orchids are good and which bad, what is new, and what is simply an old plant under a new name, is quite limited. When one remembers that at the present time there are close upon 2,000 species in cultivation, not to mention the almost countless varieties and hybrids, the necessity for the step which the Royal Horticultural Society is about to take must be apparent. A man may know ordinary garden plants well, or be an authority on some special department of flower-culture, but that does not qualify him for the post of referee where Orchids are concerned.

Disa tripetaloides is another addition to the useful garden species of this large South African genus. It is not unlike *D. racemosa*, recently mentioned in GARDEN AND FOREST, and it requires the same treatment. Mr. O'Brien, of Harrow-on-the-Hill, has imported plants which have recently flowered. He writes: "It is not only the freest growing and most profuse flowering Disa I ever saw, but also the most easily grown of South African terrestrial Orchids." It bears spikes of from twenty to thirty flowers, each about an inch across, white, united with pink, and dotted with rose-purple; the dorsal sepal is helmet-shaped, with a short spur, the lateral sepals are oblong, obtuse, proportionately large, the petals are falcate-oblong and the lip linear. At Kew this plant is growing freely by the side of *D. racemosa*, than which no Orchid appears more easy to cultivate. Whilst writing of a new Cape plant I may notice the flowering of *Drosera cistiflora*, which is now at Kew in bud, having been presented by Miss North, who not only drew attention to it by her picture painted at the Cape, but who has introduced it into cultivation. Droseras are delightful plants, and, as a rule, easy to manage. At Kew there is a good collection of species, and they are a source of much interest to visitors. They are grown in a cool, sunny green-house along with a collection of Sarracenias, Darlingtonias and other "carnivorous" plants. Guards of wire-netting are placed in front of the stages, and it is amusing to hear the opinions of visitors with regards to these plants and their "cages." The Darlingtonia is the "Cobra plant," and is supposed to have a deadly sting. Dionœa is a kind of "vegetable octopus," and so on. The cages are meant to prevent visitors from being injured by these vicious plants! Although not at Kew, yet plants are in England of *Heliamphora nutans*, a very interesting Sarracenia-like plant from the Roraima Mountain, and which was discovered by Schomburgk about fifty years ago. Messrs. Veitch are the lucky possessors of a stock of this plant.

Amorphophallus Rivieri.—A very fine example of this well-known Aroid was lately in flower with Messrs. Veitch. The scape was a foot high, the spathe trumpet-shaped and a foot across the mouth, whilst the erect club-like spadix was one and a half feet high by one and a half inches in diameter. The color was dull purple inside, and gray, with green spots, outside. Most gardeners know the foliage of this old Cochin China plant, but few are acquainted with its flowers. They are extraordinary in appearance, and were it not for their abominable odor the plant might be recommended on their account alone. I believe all the Amorphophalli have this peculiarity in their flowers. A new species, *A. Eicleri*, is in flower at Kew now, the spathe being about the size of a wine-glass, but when the tiny flowers which clothe the lower part of the spadix were open the smell was so offensive that the artist who had to make a drawing of it was compelled to inclose it under a bell-glass. When *A. giganteus* is in flower many visitors will not venture into the house where it is. This offensive odor arises from the true flowers as they mature, so that after removing them with a knife the smell disappears. The marvelous *A. Titanum* (Conophallus) is also in cultivation at Kew. Last year the tuber was like a large, flat Pumpkin, eighteen inches in diameter, the leaf-stalk eight feet high, straight and smooth as a gun-barrel, and eight inches through at the base; the blade was divided into three main branches, from which spring numerous smaller ones, the whole forming a huge canopy thirty feet in circumference. This leaf was developed in less than two months, and remained on the tuber till winter. Now the tuber is at rest, and hopes are entertained, from its size and health, that it will flower this year. The inflorescence was described by Dr. Beccari, who discovered the plant in Sumatra about ten years ago, and a life-size picture of it is in the Museum at Kew. In this the spathe is three feet in diameter, and the thick spadix six feet long. Apart from its flowers, this Aroid is one of the handsomest and most interesting of the tropical foliage-plants grown at Kew.

The exhibitions of spring-flowering plants held in the Botanic Society's gardens at Regent's Park are always of exceptional interest and rich in display; that held on Wednesday last being voted one of the best seen in London for years. Besides the usual spring-flowering bulbs, such plants as Cyclamens, Clivias, Deutzias, Cinerarias, Primulas and Hippeastrums were shown in abundance, and with scarcely an exception were splendid examples of culture and selection. Mr. James, of Slough, whose strain of Cinerarias is remarkable for dwarfness, largeness of flower and fine colors, surpassed his previous efforts by the group he showed on Wednesday. Messrs. Carter & Co., of Holborn, sent a group of their new seedling Cineraria, Emperor Frederick. It is remarkable in having the ray-florets quilled at the base, and colored violet, the spreading portion being maroon-purple. Messrs. Cannell & Sons also exhibited a very fine strain of Cinerarias. The Cyclamens from the St. George's Nursery Company, Hanwell, and from Mr. Odell, were especially good, both in size of flower and in color. The cultivation of these plants is an art known to only few, if one may judge by the wide difference between the Cyclamens of the ordinary garden and those of the specialist. If the latter is asked how the trick is done, he says we must have special houses, special treatment and specially good luck in regard to position, water, etc. Two new seedling Cyclamens, which were awarded certificates, were Faust, with flowers of an uniform deep crimson color, and Striatum, with large flowers, purplish-crimson, with a broad band of rosy-white down the middle of each segment. Should this last reproduce itself from seeds it will give us an entirely new race of Cyclamens, so far as regards color. It was shown by Mr. Odell, of Hillingdon. Hippeastrums, both new and old, were represented by several large collections. The best of the new kinds were: Lustrous, with flowers six inches across, of good form, and almost wholly deep scarlet, with crimson veins (Veitch); Optima, flowers very large, nearly a foot across, bright crimson (Veitch). Amongst the Roses shown by Paul & Son were fine examples of the pretty little fairy roses called Mignonette and Golden Fairy, both forms of *R. polyantha*. As pot plants for the green-house these bunch-flowered little roses are of great value. *R. Hardyi* was also shown in bloom. It is a delightful rose, with flowers like those of *Cistus laurifolius*, but yellow, with a crimson blotch at the base of each petal. *Boronia heter-*

ophylla was shown superbly by Messrs. Veitch. Whatever may be the opinion of horticulturists generally with regard to Boronias, there can be no question of the great beauty of this species. It forms a compact, globular little bush, a foot high, and every branch is heavily laden with bell-like flowers as large as peas and bright rosy-purple in color. For the introduction of this plant to English gardens we are indebted to Miss Marianna North, who, when in Australia about seven years ago on a sketching expedition, sent seeds of the Boronia to Kew, where it was successfully grown and flowered. It afterwards passed into the hands of Messrs. Veitch, who have been wonderfully successful in its propagation and culture. *B. heteropylla* is as delightful a garden plant as *Erica hyemalis*. Amongst the Orchids exhibited were *Brassia picturata, Dendrobium Brymerianum, Neottia corallina (N. speciosa), Lælia cinnabarina*, a very fine variety, the flowers fully three inches across and of the brightest scarlet. These were sent by Messrs. Sander & Co. From the collection of Messrs. Veitch came a fine specimen of *Calanthe vestita gigantea*, a variety which ought to be in every collection where Calanthes are grown. *Dendrobium Schneiderianum*, the hybrid referred to in my last letter, and *D. splendidissimum* were also shown. The newest feature in the exhibition was the Clivias, of which Mr. B. S. Williams sent a collection of good sorts. A group of the old *C. miniata* spoke well for the type, and also showed what progress had been made in the improvement of this plant, some of the varieties shown by Mr. Williams having flowers twice as large as the type, as full as a Vallota, and much brighter in color. Perhaps I ought to mention that Clivia is the correct name for the plants commonly known as Imantophyllums.

March 22. *W. Watson.*

New or Little Known Plants.

Hypericum aureum.

IT was in the month of July, 1776, that the younger Bartram discovered this plant upon the bank of Patse-Lega Creek, a branch of the Flint River, in Georgia, and the account of this discovery, which he afterwards published in his "Travels," gives an excellent idea of it as it now appears in cultivation. "I observed," he says, "growing on the steep, dry banks of this creek, a species of shrub Hypericum of extraordinary show and beauty (*Hypericum aureum*). It grows erect, three or four feet high, forming a globular top, representing a perfect little tree; the leaves are large, oblong, firm of texture, smooth and shining; the flowers are very large, their petals broad and conspicuous, which, with their tufts of golden filaments, give the little bushes a very splendid appearance." Afterwards the plant was found to extend from South Carolina to Alabama and to eastern and central Tennessee, although nowhere very common; but its merits as a garden plant were overlooked until a few years ago, when seeds were sent to the Arnold Arboretum by Dr. A. Gattinger, of Nashville, who thus writes of its distribution in Tennessee, where it is more common than in the Atlantic States: "The *Hypericum aureum* is addicted to rocky situations in the Cedar-glades and on bluffs and cliffs along the Cumberland River and its affluents. It is also on the base of Cumberland Mountains as far up as the carboniferous lime-stone reaches. It is not found in silicious or argillaceous soils or in swamps, but prefers such situations where the moisture is longest retained and shade is provided. It associates in the Barrens with *Rosa humilis, Forestiera ligustrina, Ptelea trifoliata, Rhus aromatica, Rhamnus Caroliniana, Cratægus subvillosa, Gonolobus obliquus, Nemophila microcalyx*, etc. It is generally not very floriferous, but I have found on the rocky ledges near the water-line on the Cumberland River, specimens with a great profusion of flowers. It grows three to five feet high."

Hypericum aureum is by far the showiest in flower among the considerable collection of Hypericums in the Arnold Arboretum, where it is perfectly hardy. It begins to flower about the twentieth of July, and continues in bloom during several weeks.

The branches are angled, covered with thin exfoliating red bark and widely paniculate near their upper extremity. The leaves are simple, rather coriaceous, oblong-obtuse nearly entire, tipped with a minute mucro, and pale on the lower surface. The flowers are an inch and a half to two inches across when expanded, with coriaceous, reflexed, orange-yellow petals, which are longer than the ovate, unequal sepals and very numerous, golden-colored stamens. The capsule is red, ovoid conical, and acuminate with the connate styles.

There are few dwarf shrubs better worth a place in the garden. Mr. Faxon's drawing is from a specimen grown in the Arnold Arboretum. *C. S. S.*

Cultural Department.

Cultivation of the Bermuda Easter-Lily.

ON the Island of Bermuda, which lies 700 miles directly south-east of New York, 800 miles due east of Charleston, South Carolina, and 100 miles east of the Gulf Stream, where the yearly range of temperature is from 54° in winter to 85° in summer, there has grown up lately an industry which will soon change the character of the trade between Bermuda and the outer world.

A few years ago an American gentleman, General Russell Hastings, who had grown to like this equable climate because of its benefit to a constitution impaired by wounds received in the war for the Union, began to experiment in the cultivation of the Bermuda Easter-Lily, which he found growing there most vigorously in everyone's flower-garden. The natives looked upon him as a dreamer for supposing that anyone would buy so common a bulb as "our Easter-Lily." And how could a large market be built up for a mere flower which no one could eat or wear? But the most sleepy Islander now begins to see that the Onion has a rival, for in the richest corner of every little farm a patch of Bermuda Easter-Lilies can be seen, while on larger farms acres are devoted to the same purpose, as may be seen from our illustration on page 187.

A market is readily found for the hundreds of thousands of these bulbs, and the supply has never equalled the demand. The Lily blossoms from January to May; the bulbs ripen in July and August, and can be put down in New York, London or Paris by the middle of August, where florists and amateurs by potting them immediately and forcing them hard under glass can obtain flowers for the holidays, or by potting later and at different periods flowers can be had all winter, and especially for the Easter decoration of churches. An effort has been made to utilize the flowers by shipping them to New York, and a box has been invented with a pasteboard receptacle for each flower, but the three-days' sea voyage damages the flowers, and when placed by the side of those grown in the northern green-house they make a poor show. General Hastings does not recommend the shipment of flowers, first, because they do not arrive at their destination in good order, and next, because it is bad business policy to offer bulbs to the northern florist, and then go into the market to compete and disturb it with inferior flowers.

It seems as if the perfume of the millions of blossoms grown here each winter might be utilized in some way. It is a delightful, though rather powerful, odor, and during the flowering season the whole island is fragrant with it. Sailors say they can smell Bermuda when far at sea.

The Bermuda Easter-Lily, sometimes known in the United States market as *L. Harrisii* (which is a misnomer), is a well-known Japanese plant, botanically named *L. longiflorum eximium*. The flower is pure white, bell-shaped, with the segments well bent back at the extremity. The perianth is about six inches long, the root is a scaly bulb, the stem herbaceous and simple, from two to four feet high, bearing the flowers at the summit, which number from eight to forty, though one monstrosity grown here in 1882 produced 145 perfect flowers.

The method of cultivation is very simple. First, very rich red soil, with an enormous amount of well-rotted stable manure is a necessity, as the Lily does not take kindly to any of the artificial fertilizers yet tried. It is a voracious feeder, as long roots are sent out from the base of the bulb, and another set of feeding roots come out from the stalk above the bulb. For successful cultivation these roots must at once strike into rich feeding ground. The bulbs are planted in August, September and October, the large bulbs in rows eighteen inches apart, and the smaller bulbs in beds like Onions. The flower-stalks appear above ground in November, and from time of planting until harvest the grower has to keep constantly weeding during every one of the twelve months of the year.

The harvest season is from the middle of July to the middle of September, at which time all the bulbs in the field, great and small, are dug and carried to the sorting house, where those large enough for the market (from five to nine inches in circumference) are selected out, packed in sawdust and immediately shipped to the United States and Europe. Those bulbs not large enough for the market are sorted into three sizes and replanted for the next year's crop.

The power of this Lily to propagate itself is most wonderful in this climate, and new bulbs are formed in many ways: from seed, from offshoots, from scales of the bulb, and from cuttings of the flower-stalk planted in the ground after blossoming. Even the leaves of the flower-stalk, stripped off and planted in the ground, will form bulbs, and a flower-stalk cut and placed in a bottle of water will form bulbs from top to bottom. The method most in vogue, however, is to take well-ripened bulbs two or three years old, having a circumference of about twelve inches; tear off all the scales, scatter them in a shallow trench and cover with about two inches of soil. Each scale will make from two to six new bulbs, which will grow the first year from the size of a pea to that of a large Hickory-nut, and probably one-third of these bulbs will grow large enough for the market at the end of the second year.

These large bulbs which have been stripped of scales are planted, and in two years can be stripped again, and so on forever. Many bulbs propagate themselves by offshoots of the healthy growing bulbs in the field, and a field planted out to Lilies for several years becomes alive with new bulbs from offshoots and bits of scales broken off when the crop is harvested. These bulbs coming up between the rows are spaded under when the soil is cultivated.

The question is often asked, Cannot the business be overdone? This hardly seems possible, as the florist who forces the bulbs in his northern green-house throws them away at the end of the season, and buys again the next year, as he cannot economically "ripen off" his bulbs, and, even if he could, they would not flower well the second year. Again, the demand comes from so large an area—from the United States, England, France, Germany, Austria and Russia—a market field large enough, surely, for a little island containing but 1,200 acres of arable land.

This bulb is grown to some extent in Japan, but it is not possible to get the crop from Japan into the United States and European markets before November, and even then the bulbs are not as floriferous as those grown in Bermuda.

Hamilton, Bermuda. *Paul Harger.*

Fig. 103.—Hypericum aureum.—See page 184.

Carnations for Winter Blooming.

NEARLY all the varieties of Carnations grown in America for winter blooming are of American origin. Many of the best English kinds have been tried, but few have proved useful. Most of the imported kinds are too vigorous—"too grassy," to use an old grower's expression. The flowers are too full as a rule, and incline to burst. The majority of our varieties are dwarf in habit, being almost self-supporting. The flowers are thin, but of fine form, and I think these varieties would be useless out-doors in England owing to this very fact.

Mr. Tailby, of Wellesley, who raised Grace Wilder, a very popular variety, with rose-colored flowers, says that when Americans began to grow Carnations, planted out on beds and benches, they found the old English varieties, which they had been accustomed to grow in pots, unsuitable, and therefore commenced to raise seedlings, and they selected the dwarf semi-double ones, which to most people would appear worthless, using these as parents, though occasionally crossing them with others of good habit and color, but with flowers of indifferent form, to produce, if possible, the kind adapted to our needs. The work was tedious, and only those having a real love for it could continue, for good time and space often went for nothing. Many of the seedlings, when first blooming, would appear satisfactory, but when propagated and prepared in the usual way would turn out worthless, and, again, others taken up, after being virtually discarded, have turned out well.

We have excellent scarlets in Alegetaire, Florence and an unnamed seedling; good crimsons in Anna Webb and Orient; violets in Victor and Century; salmon in Madame Rollicker and another unnamed seedling. The only excellent rose-colored variety we have now is Grace Wilder. The good yellow, for winter blooming, has yet to be found. Pride of Penshurst has lovely form and color, but poor habit, and is very late, as also is Belle Halliday. Andalusia is early enough, but of poor habit and form. Of striped yellow varieties of moderate earliness and fair form, Buttercup is the best. Madame Carle is the best white we have, of fine form and color, a free bloomer, of good habit, but a little late. Snowden is an old stand-by, likely to hold its own. The flowers are of good form, but small. Mr. Tailby has a pure white sport from Grace Wilder, which he intends naming Our Mary.

The practice is to strike cuttings in benches or boxes filled with rather coarse sand, with just enough plastic matter in it to retain moisture, and made very solid by beating with a brick. The cuttings require very little preparation. An experienced man would put in 2,000 per day. No knife is used, the tips, with only two to three joints, being snapped off. They are put in with a common dibbler, which is not driven into the sand farther than is necessary to insert the cuttings, and there is little prospect of their rooting unless set firmly in the sand.

The cuttings are kept saturated with water and shaded until they stand well up under sunlight. Pricking off into boxes, or potting into thumb-pots, is the next work. Sandy loam should be used, and made firm in the pots. As soon as established, and growth enough made to allow the tips to be pinched out, this is done and continued until about the second week in July, when they are allowed to develop flowering-stems. A good, heavy loam is the most suitable soil to grow them in, both in the houses as well as when in preparation out-doors. A good, airy house, with night temperature of 50° suits the plants. The foliage should never be wet unless a bright day is assured. During January a top-dressing of wood-ashes and leaf-soil is given, which helps the blooming along until May.

Wellesley, Mass. *T. D. Hatfield.*

Memoranda from a Northern Garden.

FOR several years I have been interested in a little native plant found, according to Mr. Pringle, in few localities in Vermont—the Strawberry Blite—*Blitum capitatum*. Spinach will not winter in my grounds, but the Blite does not mind the cold, however severe; and as it starts into growth the moment the snow departs, it makes as early greens as the Dandelion, and to my taste quite as good as Spinach. The Blite is a pretty persistent weed, so far as reproduction from seed goes; and the seeds are almost as small and quite as numerous as those of Purslane, yet it is easily killed with the hoe. The brilliant crimson color of its pulpy but insipid fruit, with its abundance, makes the Blite a pretty plant in the flower-garden, when well grown.

Speaking of Purslane reminds me that though it grows here as freely and as rankly as it grew in my old Kentucky home, it is worth nothing for greens, for it will not cook tender when grown so far north. I find the same trouble with Okra, the dwarf, early form of which grows and forms pods freely enough in my garden; but they are worthless for use, being hard and woody before they are half grown.

In most years I manage to get fairly good Water-melons and Musk-melons in my garden, from seed started in pots under glass, and transplanted about the tenth of June. Even last year my whole crop of Christiana ripened nicely before the frost of September 5th destroyed the vines; but the first ripe one was twelve days later than the season before. Of course we can grow later sorts by giving each hill a hot-bed to itself, and not moving them. The famous Montreal melons are grown in that way.

Growers about New York decry the Montreal melon as large, but coarse and insipid. Those who have eaten it in its home know much better than that, and some in New York, at least, have had a chance to try those which have been shipped in from Montreal, as they have been quite abundantly in some seasons. The whole secret is, I think, that the Long Island and New Jersey gardeners have not learned the trick of growing them properly. These big melons are gross feeders, and must have ground much richer than that on which smaller sorts will succeed.

Newport, Vt. *T. H. Hoskins.*

Heating Green-houses.

PROFESSOR S. T. MAYNARD has been conducting some interesting experiments to ascertain the relative value of steam and hot water for heating green-houses, and a report of the conclusions reached are given in a late Bulletin of the Massachusetts Agricultural College Experiment Station. Two green-houses of the same size—seventy-five by eighteen feet—were constructed as nearly alike as possible in every particular. Two boilers of the same pattern and make were put in, and one was fitted for steam to heat the east house, and one for hot water to heat the west and more exposed house. Records of temperature were made five times a day, and from these the following averages are taken for the month of January: Average out-door temperature, 29.1°. For the house heated by hot water the in-door minimum daily temperature averaged 42.7°; maximum daily temperature, 55.1°. Average in-door temperature, 47.5°. In the steam-heated house the temperature varied between 41° and 55.1°, with an average of 45.9°. The coal consumed in the hot-water house was 2,532 pounds, and in the steam-heated house 3,220 pounds. In February the average in-door temperature of the hot-water house was 49.6°, with a total coal consumption of 2,642 pounds, and of the other house the average temperature was 47.9°, and the coal consumption 3,362 pounds. According to this test hot water, with nearly twenty per cent. less coal, gave a temperature 1.7° higher, and a temperature, too, more uniform than that furnished by steam heat.

This only shows that for this mild winter, and with these particular machines, hot water has proved more economical and satisfactory as a method of heating than steam in houses constructed like these two. Still, so far as it goes, it is a fair test, and we are not aware that any similar trial has been conducted. In larger houses and in a colder winter the result might have been different, and Professor Maynard is preparing for careful and accurately recorded comparisons for another year. Meanwhile he invites all who have kept records of the temperature of their green-houses, together with the amount of coal consumed, to send him the figures, giving also the size of the house and the kind of apparatus used.

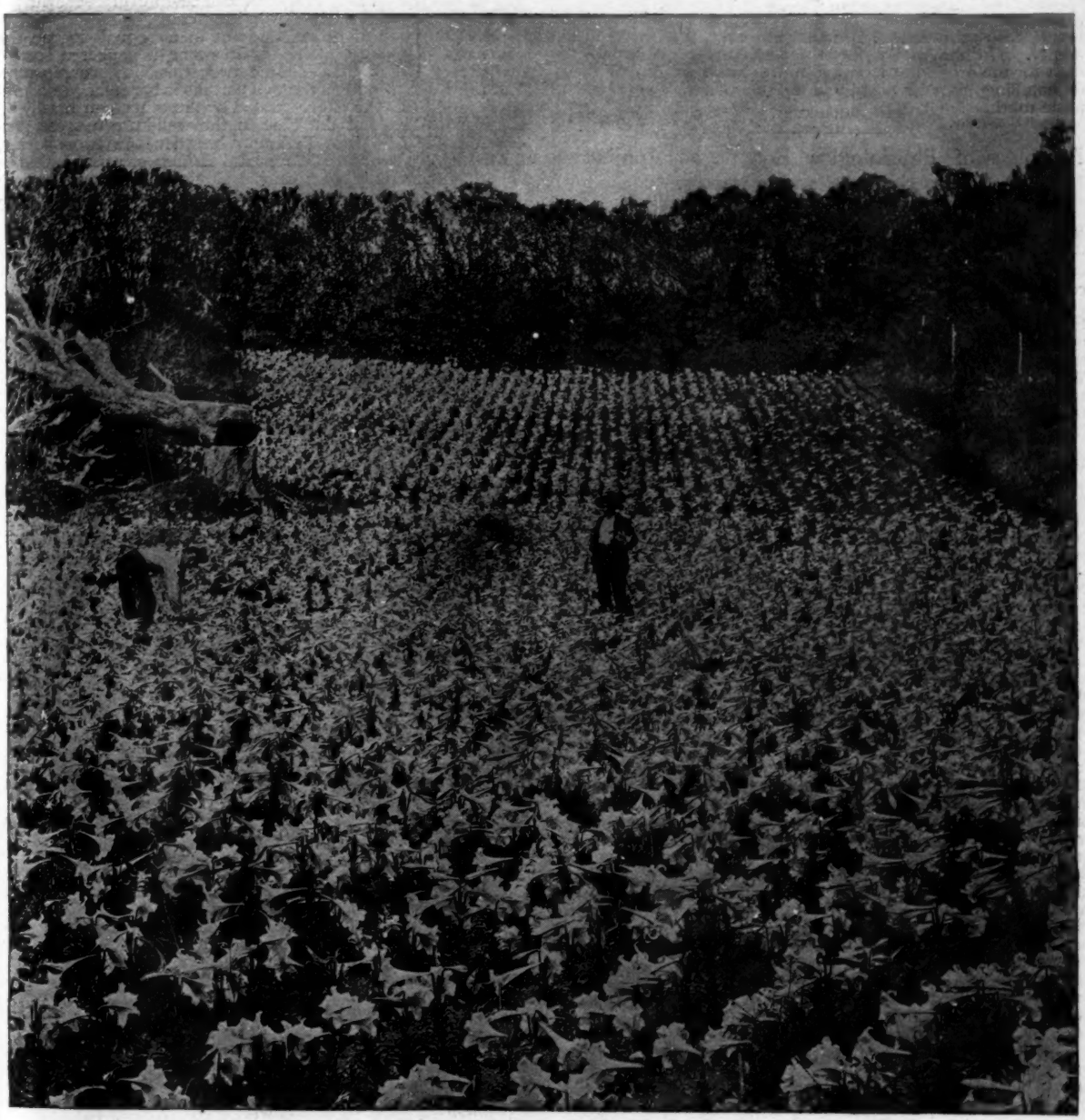
Spring Flowers.

OWING to the exceptionally mild spring, hardy-flowering plants and bulbs are making a display fully two weeks in advance of their usual flowering period. First in the order of flowering comes *Ranunculus anemonoides*, with its masses of Anemone-like, pale pink flowers, an inch across, produced in advance of the much-divided, glaucous-green leaves. This plant is comparatively new, being introduced into cultivation from the Styrian Alps in 1883, and it is a charming little plant. *R. anemonoides* succeeds well in a moist position in the open border. *Fritillaria pudica* has been noticeable for its pretty, pendent yellow flowers, usually solitary, on stems six to eight inches high, and lasting a month in good condition. This plant is a native of the western states. Coulter in his "Manual" gives it as distributed through "Utah and Montana to the Sierra Nevada and British Columbia." It cannot, however, be very plentiful, as collectors refuse to supply it at any

price. This is to be regretted, as *F. pudica* has a chaste beauty peculiarly its own. *Iris reticulata* is now at its best. As soon as frost leaves the ground the flowers of this pretty Iris are produced simultaneous with the leaves, and is a good plant for planting en masse for spring effect. Its variety, Krelagei, is a few days earlier, of a paler color, and devoid of perfume, which latter the species possesses to a pleasing degree. *I. reticulata* produces offsets from the bulbs quite freely, and these may be relied on to flower the second year. Beds of *Bulbocodium vernum* have a pleasing effect already, their purple Crocus-like flowers being produced in advance of the foliage. When these are planted *Colchicum autumnale* should be mixed with the Bulbocodiums. This will give a corresponding crop of bloom, of the same appearance in fall. *Erica carnea* is blooming more freely than it has ever done. One plant here a yard across makes a striking display, being literally smothered with its pretty pink flowers. Many think the Heather is not hardy in this section. It is hardy enough here as regards standing the cold, but unless protected by snow or some other covering, bright sunshine scorches the tops in very cold weather. *Eranthis hyemalis*, the Winter Aconite, *Scilla Sibirica* and the Crocusses are all in bloom, making the hardy flower-garden an attractive spot, even though frost does visit us every night.

Passaic, N. J. *E. O. Orpet.*

Hot-beds and Forcing-houses.—Hot-beds must go, at any rate for commercial business. Forcing-houses are cheaper in the long run, safer, and give better plants. Any man with a stroke of ingenuity can engage a carpenter and build his own. Build low, with a very flat roof. Heat with steam. Get the tables near the glass. I like a two-thirds span if I can get a nice southern exposure. Ventilate by raising the whole sash. Have all sash removable. Use gas-pipe for pillars. I have just completed a nice house, 20 x 60 feet, for $800, heat and all complete, and have heating capacity for one or two more of the same size. It is a fine, substantial house.



A Field of Lilies in Bermuda.—See page 184.

Plant Patents.—It is certainly desirable that the originator of varieties should be protected. But I cannot see that plant-patents could be feasible, even if possible. In the first place, it is exceedingly doubtful if a patent could be had for those varieties which spring up from a chance seeding, and it is a fact that most of our varieties come in this way. But granted the patent, there are cases innumerable in which no jury, even of experts, could agree concerning the identity or distinctness of varieties. There are those who contend that no two varieties can be alike if they originate in different places, even though there are no characters to separate them. Of this class is Jacob Moore, perhaps the leading advocate of plant-patents, and he argues that expert growers will not confound such varieties. The facts, however, are against this theory. On the whole, there appears to be no better way than for the originator to adopt more business-like methods of handling his new sorts, and to sell under a copyrighted trade-mark.

Cornell University. *L. H. Bailey.*

Principles of Physiological Botany, as Applied to Horticulture and Forestry.

XVI.—Hybridization.

IN what we have called cross-breeding, we keep within the limits of the species, using the pollen of one variety to act on the pistil of another variety of the same species. And, of course, we can cross races in the same way.

Now if we pass beyond the confines of the species and attempt to cross two different species, using the pollen of one to act on the pistil of another, we are undertaking what is known as hybridization. A hybrid is a cross between two species. The term has, however, been rather loosely applied; in fact, some writers have included crosses between varieties as hybrids, and such variety-hybrids frequently figure as true hybrids in some catalogues of plants. In the present paper it is designed to restrict the word wholly to crosses between what are accepted as true species.

First, as to the occurrence of hybrids in nature, little need now be said. That there are some well-marked hybrid Willows and hybrid Oaks is generally believed by all botanists, but the evidence on which such conclusions rest is, of course, inferential. Therefore it is better for us to turn at once to the consideration of artificial hybridization and note its methods as well as its results.

The method is simple theory, and not difficult to put into practice. The flower which is selected as the female is carefully treed from all of its stamens, with their pollen-bearing anthers, and then its stigma crowning the pistil is to be carefully dusted by pollen from the flower selected as the male. The transfer of the pollen can be effected by means of a sable pencil or camel's-hair brush. It is not necessary in all cases that the pollen should be absolutely fresh, for the pollen of some plants can maintain its vitality for a long time, but care must always be taken to see that the pollen is perfectly ripe. Moreover, the stigma of the pistil to which the pollen is applied must be just mature and receptive. If it is not mature, or if it has passed its period of complete receptivity, the pollen will not have its full effect; in fact, it would probably not have any effect at all.

After application of the pollen has been made, care must be observed that all insects are excluded, and that no foreign pollen is conveyed in any manner to the flower. Further than this, no special caution need be exercised. If impregnation has been effected the seeds will "set," and the fruit will go on to ripeness. It is worthy of note that in many cases of hybridizing, the fruit will apparently ripen and the seeds will seem to to be good, while in point of fact they are worthless. In general it should be said that, in hybridizing, the blanks are many and the prizes are few.

The range of selection of species between which this process can be tried with a fair chance of success is wide. It is not possible, however, to state beforehand whether a given trial will prove successful, for there are some instances in which the process is not even reciprocal; that is, there are cases in which the species A can be used with success as the female element in the experiment, but will utterly fail if it is employed as the male, whereas the species B may behave in just the opposite manner, being capable of furnishing pollen which will be efficient, while its pistil might not prove receptive.

In general, the species selected should be nearly related. There are a few cases on record in which species belonging to different though closely allied genera have been successfully crossed, but it may well be that the limits of such genera are yet to be changed by systematic botanists. This has already been done in the well-known genera Azalea and Rhododendron. Certain species of these two genera can be made to cross with each other, and their cases have formerly been cited as showing that different genera can be hybridized. Recent classification, however, has placed these two genera under one head, and the two are now known as Rhododendron.

It is an interesting fact that frequently in a genus there is one species which seems particularly well adapted to serve as the male or female factor in hybridization. Among the Rhododendrons the species called Rhododendron Catawbiense has played this part in the innumerable successful crosses with the tender species of the Himalayan Mountains.

Hybrids generally share, but not in an equal degree, the characters of the two parents. In some instances a sort of average is struck between the two; this, however, is rare. The influence of one of the two parents is sometimes so preponderating that the effect exerted by the other can hardly be discerned. This was the case in the well-known cross produced by Mr. Francis Parkman between the two species, *Lilium speciosum* (*lancifolium*) and *Lilium auratum*. Of the offspring from this cross only a single plant shared to any marked degree the characters of the two parents, but the wonderful and beautiful exception appeared to combine, in almost equal amount, the striking and desirable peculiarities of both.

As a rule, the roots, stems and leaves of hybrids are stronger and the flowers are more showy than those of either parent, but there is a marked diminution in the reproductive power. Hybrids incline to be sterile, but this sterility is by no means complete. There are many cases of fertile hybrids.

The offspring of hybrids possess a remarkable tendency to vary. The progeny have been said to cut adrift from the ancestral moorings, and they appear to drift passively in subsequent generations. This curious fact has been made use of by cultivators who have desired to obtain variant forms. They first of all secure a fertile hybrid, and employ this for careful seed-breeding.

Since hybrids are so rarely wholly fertile and, besides this, have a marked tendency to vary in their offspring, it is generally best to propagate by means of their buds in some way.

Derivative hybrids are those which result from the union of a hybrid with one of the parent forms or with a hybrid from a totally different source. In all these cases there is a tendency towards reversion to one of the ancestral types.

One of the most puzzling cases of blending of different characters is that known as *graft-hybrids*. When some of the variegated forms of Abutilon have been grafted on green-leaved forms, a few of the subsequent shoots of the stock have been more or less affected by the variegation. The most remarkable case of this is that of *Cytisus Adami*,* a plant which presents a form midway between *Cytisus Laburnum* and *Cytisus purpureus*. While there are many who believe that we have here a case of a hybrid produced by seed, the history as originally given indicates that the blending resulted from placing a bud of the former in the stem of the latter. The case is not wholly without its bearing on what has been noticed in some of our fruit-trees.

Cambridge, Mass. *George Lincoln Goodale.*

Recent Publications.

A Manual of Orchidaceous Plants. James Veitch & Sons. Part IV. *Cypripedium.* London, 1889.

The present number of this excellent publication is devoted to a description of the tropical Cypripediums, which are, perhaps, just now occupying the attention of the horticultural world more strongly than any other class of plants. We cannot give a better idea of the general characteristic of the work and the method in which the subject is treated than by laying before our readers some rather extended quotations from its pages, which abound in interesting information and sound practical advice. After speaking of the fact that the peculiar structure of the flower of the Cypripedium shows that many relative or intermediate forms have been swept away, leaving this single genus as a record of a former and more simple state of the great Orchidaceous order, the author goes on to show "that the structure of the flowers does not furnish the only evidence of the Cypripedes being a more primitive race of Orchids than any other existing forms. The geographical distribution of the genus, especially of the two sections of it that form the subject of these pages, reveals some remarkable facts respecting the present history of the included species, all of which tend to the conclusion that the individual plants comprising them must at one time have existed in great numbers,

* See Gray's Text-Book, vol. 2, p. 445.

and have been spread over a much larger area than they at present occupy in a wild state, and that a gradual process of extinction has been as surely in operation here as it has been with more primitive types in other Natural Orders that are now become only subjects for the study of the geological botanist, although, of course, the epoch of final extinction may be yet far remote, and the race may be preserved indefinitely by the hand of man. Paradoxical as this may appear to the horticulturist habituated to regard the Cypripedes as being among the easiest of Orchids to propagate, the following considerations will go far to show that the statement here offered rests upon a good foundation. Although the Cypripedes are still spread over large portions of the earth's surface, both in the eastern and the western hemispheres, the included species have, almost without exception, retreated to sections that are extremely restricted in area, and frequently isolated and remote from each other; so that while some species are abundant in their known habitats, and have been and are still imported into Europe in quantity, it is very different with other species; for example, the habitat of the beautiful *Cypripedium Fairieanum* is practically unknown, and all the existing plants in cultivation have been derived from the three or four that were first casually imported. Two plants only of *C. superbiens* that appeared accidentally among importations of *C. barbatum* are believed to be the progenitors of all at present known, and it is quite uncertain whether the species still exists in a wild state. *C. Mastersianum* has been but once imported, and its habitat is unknown to science. *C. tonsum* was sent to us in company with *C. Curtisii* unknown to its discoverer, who informs us that the last-named is quite rare, while its near ally, *C. ciliolare*, although somewhat more plentiful, has retreated to a remote corner of the Philippine Islands. *C. purpuratum* has become almost extinct as a wild plant in Hong Kong, and it is fast disappearing before the pressure of population on the Chinese mainland. The Cypripedes of South America present a similar case in their history. *C. Boisserinnum*, one of the first species discovered on that continent, has been found only in a sequestered valley high up on the Andes of Peru, while thousands of miles distant from that lonely spot, on the Roraima Mountain of British Guiana, *C. Lindleyanum* and *C. Klotzschianum* have their home; and still further remote from either, on the Organ Mountains of southern Brazil, *C. vittatum* occurs, and nowhere else. Nor are there instances wanting among the hardy Cypripedes to prove that the same process of extinction is still in operation. Our native *C. calceolus* has become virtually extinct in this country as a wild plant, although, owing to its extensive distribution over central Europe, it is still comparatively abundant in some spots, while in others it is visibly yielding ground to the pressure of cultivation and the presence of a dense population; and this is also true of all the Japanese and of several of the North American species.

"The true cause of the gradual extinction of the race is probably to be sought for in the reproductive organs of the flowers. A very cursory examination of these must satisfy most observers that self-fertilization is impossible, and the sexual apparatus is so constructed that few among existing races of insects are found capable of effecting the necessary act of fertilization that secures the perpetuation of the plant by seeds.

"That the tropical Cypripedes are similarly circumstanced in their relation to insect visits is in the highest degree probable, for direct observations are, unfortunately, altogether wanting; and the probability is strengthened by the fact that among the thousands of plants imported by us during the past thirty years we have rarely noticed a single seed capsule. The inference is thence by no means an unreasonable one that the fertilization of the flower by insect agency is a rare, or comparatively rare, occurrence, and the perpetuation of the species must depend chiefly on new growths from the rhizome, by which the plants spread laterally, so far as food materials are at hand to support them. But the stations in which, for the most part, they are found, and where they must have originally sprung from the stray seeds that lodged there, are in the crevices of the rocks, and in a few cases on the branches of trees, where there is necessarily an extremely restricted accumulation of vegetable matter; their spread by this means is thence reduced to the narrowest limits."

The restriction of the genus first proposed by Reichenbach, by the exclusion of the South American species, now referred to Selenipedia, is only attempted under protest, as it were, as the following extract explains:

"We have, however, strong grounds for believing that this dismemberment of the Cypripedia is not final; for, notwithstanding the very important difference in the structure of the ovary of the South American species, these cross with the Cypripedia of India and the Malay Archipelago, and progenies derived from this hybridization have been for some time in existence, and are receiving yearly additions to their number from various operators. The facts of the case, as it now stands, must, however, be fairly stated; the East Indian species cross freely with each other, and a numerous progeny of hybrids has resulted therefrom; the South American species also cross freely with each other, and many new forms have been obtained; the hybrids in both sections flower within a few years from the germination of the seed. But in the case of the crossing of the Indian with the South American species, the process has been much slower in producing results; an infinitely smaller proportion of seed germinates, and those seedlings that survive are so slow in arriving at the flowering stage that up to the present time, so far as we are aware, not a single plant has flowered, although the plants in our houses continue strong and healthy in appearance and yearly increase in size. Till these plants flower—and there is no apparent ground for belief that they will not—and the structure of the ovary of their flowers shall have been examined, we prefer to adhere to the original circumscription of the genus, certainly a very natural one, and to regard the ovarium character as of sectional value only. This view is strengthened by the discovery and introduction of the remarkable *Cypripedium Sanderianum*, a Malayan species that brings the relationship between the East Indian and South American Cypripedes morphologically still nearer than its previously known allies, *C. Parishii*, *C. Stonei*, *C. Philippinense*, etc., have done."

Of the true Cypripedia, exclusive of those inhabiting the north temperate parts of the world, "about thirty species are well authenticated, all natives of a region lying between the 27th parallel of north and the 10th parallel of south latitude, and between the 75th and 150th meridians of east longitude; they are altogether absent from Australia, and so far as at present known, from Africa and Madagascar; they are thence confined to a comparatively limited space within the Indian monsoon-region. They either follow certain mountain chains on which the species occur in groups of twos and threes, or are isolated and far remote from each other, or they are confined to particular islands or group of islands. In the former case they usually occur at a considerable elevation, where the rain-fall is copious and frequent, and the dry season of short duration; in these elevated situations they are found growing chiefly on the ledges and in the crevices of the limestone rocks, which constitute the chief geological features of these mountain ranges, in places where there is a small accumulation of decaying vegetable matter. These localities are often steep and precipitous, extremely difficult of access, sometimes fully exposed to the sun's rays, but more frequently in partial shade afforded by projections and overhanging trees. The insular species usually occur at a much lower elevation, not infrequently close to the sea-shore, and where the mean average temperature is naturally higher than that in which the mountain species grow. At least three species have been observed to have their homes on the stems and in the forks of the branches of trees, sometimes growing on the decaying fibrous roots of ferns.

"By far the greater part of the Indian and Malayan Cypripedium region lies within the equatorial zone, and is thence subject to all the climatic phenomena peculiar to that zone; these are fully stated in the introductory notes to Dendrobium. The species found outside this zone are chiefly north Indian, and occur on the Sylhet, Khasia and Garrow Hills, also in parts of the lower Himalayan range, extending from Sikkim to Eastern Assam, succeeded still further eastward in Hong Kong and in the mountains in southern China by *Cypripedium purpuratum;* the climate of this part of the region is also described in our notes on the geographical distribution of Dendrobium, to which the reader is referred."

Of the production of hybrids no one can speak with greater authority, and the following cultural notes are therefore of real practical value: "No genus or race of Orchids that has yet been brought under cultivation has yielded so readily, and, we may add, so strikingly, to its influence as the Cypripedia. This is not only apparent in the results of hybridization, which will be noticed more particularly after the description of the species, but also in the species themselves, especially in those that have been longest under the cultivator's care. The most obvious effects of the cultural influence have been the development of more robust foliage of a brighter color, especially in those species with tesselated leaves; the normally one-flowered scape occasionally becomes two-flowered; the scapes themselves are more robust, often more elongated, and produce larger flowers, generally attended with some modification of color. Doubtless the chief cause of these changes is the more

abundant and the more regular supply of food material, by which the plants acquire a vigor rarely seen in those imported from their native countries.

"The geographical distribution of the Cypripedia included in this section sufficiently indicates the temperature in which they should be cultivated in the glass-houses of Europe, which is that of the East Indian house for most of the species and hybrids, that is to say, a house in which the night temperature in winter is never allowed to sink below 15°–12° C. (60°–55° F.), with a gradual rise as the season advances to 18°–21° C. (65°–70° F.), at which it should be maintained from May to August. The day temperature, by fire-heat alone, should be about 3° C. (5°–6° F.) above those of the night. A few species, chiefly insular, including *Cypripedium concolor*, *C. niveum*, *C. Godefroyæ*, *C. Philippinense*, etc., thrive best in the higher temperature of the Phalænopsis house; on the other hand, *C. insigne*, *C. venustum*, *C. Fairieanum*, and the hybrids obtained from them may be cultivated in the intermediate house.

"It is evident, too, that as the great majority of the tropical species occur within the equatorial belt, or sufficiently near it to come under the like climatic conditions, of which the most noteworthy are the remarkable uniformity of temperature and the high degree of atmospheric humidity throughout the year, there is practically little or no interruption in their vegetation in their native homes. But when transferred to the glass-houses of this country, it is equally clear that such a uniformity of climatic conditions cannot be so strictly maintained by artificial means, owing to the succession of the seasons; hence there is, at least, a partial cessation of growth, if not absolute rest, during the coldest months of the year. Advantage should be taken of the recommencement of their growing seasons to re-pot the plants not then in flower; they should be potted in a compost of sphagnum moss and fibrous peat in about equal proportions; the drainage should be kept quite free; it should consist of clean broken crocks, with which the pots should be filled to one-half or even two-thirds of their depth, according to the size of the plants. As the roots of Cypripedium grow vigorously, ample provision should be made for their development.

"The plants must at no time be suffered to get dry at their roots during the growing season; a high degree of moisture must be maintained in the atmosphere of the house, the amount and frequency of the watering and the sprinkling of the floors, etc. of the house being, of course, regulated by the season of the year and the external circumstances of the weather, etc. The ventilation must also be regulated according to external influences, but it should at all times be as free as is consistent with the well-being of the plants, avoiding cold draughts and sudden changes of temperature. In the summer months the plants should be protected by shading from the direct rays of the sun; a very slight exposure to direct sunlight at that season causes the foliage to change color; this is particularly the case with those species that have tesselated leaves."

Of the Selenipedia, or South American Lady Slippers: "About ten species are known to be genuine, of which six inhabit the Cordilleras of western South America, from Bolivia to Chiriqui in Central America, at elevations of 3,000 to 5,000 feet; three occur on the mountains of British Guiana, and one on the Organ Mountains, near Rio de Janeiro. The localities indicated on the accompanying map must, in several cases, be accepted only as approximately true; the names given by plant collectors are often not to be found on any map within reach, and are, moreover, frequently misleading.

"Cultural Note.—The cultural treatment of all the members of this section, both species and hybrids, is the same as that of the East Indian Cypripedes, with the exception of the temperature, which, on account of the altitude at which the species occur in a wild state, should be 3°–5° C. (5°–9° F.) lower. All the species in cultivation, with the exception of *Cypripedium Schlimii* and, perhaps, *C. Klotzschianum*, whose scapes are few-flowered, continue in flower for several months.

"Hybrids.—In our introductory notes we have adduced the principal evidence upon which rests the hypothesis that the flowers of Cypripedium in a state of nature rarely produce seeds, owing to the absence generally of the agencies by which they can be fertilized. Under such circumstances, therefore, natural hybrids cannot be expected to occur, even where two species are found growing intermixed if in close proximity to each other; and it is a remarkable fact—a fact that unquestionably tends to strengthen the evidence we have cited, circumstantial as it is in some points—that no Cypripedium having the aspect of being a natural hybrid between two recognized species has ever yet appeared among importations of the species, as undoubted natural hybrids have appeared among importations of Cattleya, Lælia and Odontoglossum. In strong contrast to this stands the multitude of hybrids raised artificially in the glass-houses of Europe, among which are new forms of exceptional interest, and of so vigorous a constitution that they may, in truth, be regarded as the forerunners of new races. Without attempting to anticipate results to be hereafter obtained from the intermixture of these races with each other and with the pure species, it may be safely affirmed that no greater triumph has been achieved in modern times by the gardener's art than the production of these hybrid Cypripedes.

"The first hybrid Cypripedium was raised by Dominy, from *Cypripedium villosum* and *C. barbatum*, more than a quarter of a century ago, at our Chelsea Nursery, and was distributed in 1871; it is appropriately named *C. Harrisianum*, in compliment to the late Dr. Harris, of Exeter, who first suggested to Dominy the feasibility of hybridizing and raising Orchids from seed. This was followed at short intervals by *C. Dominianum* and *C. vexillarium*. The first seedling raised by Seden is the well-known hybrid that bears his name, and which was distributed in 1874; this has been followed up to the present time by an uninterrupted series of results which, apart from successes obtained in other genera, has secured for the raiser's name a permanent place amongst British hybridists."

But we have already drawn liberally from Mr. Veitch's pages, and for further information about these plants, and for detailed instruction about the cultivation of the different species, we must refer our readers to the book itself. They will find it one of the most interesting and instructive works of horticulture which has appeared for a considerable time. The subject is admirably treated, and this makes it all the more to be regretted that the faults in book-making, to which we have already alluded in noticing earlier issues, are still adhered to—faults which must always injure its value as a work of reference.

Periodical Literature.

The *Popular Science Monthly* for April contains an excellent and timely article by Dr. Shufeldt on "Zoölogical Gardens, their Uses and Management." It is unnecessary to summarize the paragraphs which detail the direct services of such gardens or the many ways in which they may indirectly further the interests of public education and scientific progress. All intelligent persons know that they have a value far beyond that of affording a lounging-place for curiosity seekers. But it is important to emphasize the author's declaration that they infallibly degenerate into such lounging-places if the collection is "heteorogeneously collected" and "purposelessly arranged." To be useful in any degree the selected site must be suitable for its purpose, and the collection must be arranged and managed on strictly scientific principles. "If possible," says Dr. Shufeldt, "the form of the grounds should be a regular figure, an oblong being one of the best, with a long side toward the direction whence come the prevailing winds, as this assists in securing good ventilation, and the area should include at least 200 to 250 acres. . . . Another matter of great importance is the character of the country, which should be as diversified as possible, and the enclosure should contain a few sizable ponds or a good, strong stream of water, in which event the former can easily be constructed artificially. Old trees in groups, some low, level, marsh land, and some hills and rocky portions are all points of extreme natural advantage. These latter features, if marked, usually insure, too, another benefit, for then hilly or broken country is likely to be found immediately beyond the limits of the garden, which, though conducive to the building of handsome suburban residences, is not likely to fill up entirely with houses as the city increases in size, and thus excellent ventilation is secured for all time." Of course, common sense, as well as a desire to create an attractive place of resort, demands such a site as is here indicated. Quoting from Professor Flower the author continues: "The old idea of keeping animals in small, cramped cages and dens . . . still lingers in many places. We have a responsibility to our captive animals, brought from their native wilds to minister to our pleasure and instruction beyond that of merely supplying them with food and shelter. The more their comfort can be studied the more they are surrounded by conditions reproducing those of their native haunts, the more enjoyment and instruction we shall obtain when looking at them." For these reasons, it is clear, the area of a zoölogical garden should be large and its surface should be varied to give proper homes to animals of different habits. Can any one deny the truth of these words? or, after reading them, can any one think that there is room within our Central Park for the establishment of a

zoölogical garden worthy of the name? The area which Dr. Shufeldt, who has carefully studied the subject in foreign lands, declares barely sufficient, means one-third of the whole area of this park. The remarks which he adds upon these accompaniments in the way of libraries, lecture-rooms, dissecting-rooms and museums which should be found in a zoölogical garden do not so nearly concern us here. Everything that he asks is desirable, indeed essential, to the creation of an ideal zoölogical garden, and almost everything could be secured in New York did public interest rise to the level of the occasion. There might be a little longer distance between the garden and the city museums and libraries than he thinks desirable, but New Yorkers are used to long distances, and nothing but money enough and a selection of wise and disinterested managers, who shall not be politicians, is needed to secure all other convenient and useful conditions. But the clearer and wider becomes our idea of these conditions the more absurd it seems that anyone should fancy for a moment that the Central Park could be arranged to afford them, even though it were entirely ruined, as a park, in the process of adaptation.

Correspondence.

An Interesting Garden and a Good Gardener.

To the Editor of Garden and Forest:

Sir.—Good, all-round gardeners are rare in these days everywhere; perhaps they have always been difficult to find, but they are especially rare in the United States. Modern fashions in horticulture have been a serious hindrance to real advance except in a few very limited directions. Gardeners who have learned their business in the last thirty or forty years have learned a great deal about propagating and growing a few varieties of soft-wooded, tender plants, and about massing them together for the summer decoration of unnatural gardens, and they have learned, too, and most successfully, how to flower Orchids and how to develop all the beauty of leaf-coloring of many inhabitants of tropical swamps. But this has often been done at too great a sacrifice, and it is now rare to find a gardener who is as much at home with fruits and vegetables as he is with Orchids or herbaceous perennials, or one who knows much about trees and shrubs or about forcing, or, what is rarer still, one who knows and can grow hard-wooded, green-house plants.

These thoughts came into my head lately as I was walking through one of the old gardens of the Boston suburbs, that of Mr. John L. Gardener, of Brookline, which for nearly a quarter of a century has been under the entire charge of Mr. C. M. Atkinson, one of the few old-fashioned gardeners now left in America, and one of the most successful men in all departments of gardening who has ever been in this country. It is always instructive to visit these gardens, and the visitor never comes away without at least one valuable bit of information, conveyed in quaint and picturesque language, about some now little known or half-forgotten plant.

There is no garden I know where the good old hard-wooded plants are grown so successfully, or where so many different classes and varieties of plants in the different departments of the garden may be seen in better condition. But the hard-wood plants are best worth mention, perhaps because they are less often seen now than any others, and because they are, it seems, more difficult to grow. The variety is not very great, but there are admirable plants of *Eriostemon intermedium*, one of the most beautiful of the winter-blooming Australian shrubs, which, perhaps, cannot be matched now anywhere, and which would have done credit to the great day of English horticulture, when Mrs. Lawrence reigned supreme in the London flower-shows. Eriostemon belongs to the same family as the Orange, and its flowers, although slightly tinged with pink and quite destitute of perfume, resemble those of the Orange in size and form. It is a compact shrub, three feet or more high, of excellent habit, and it lasts in flower during eight or ten weeks. One of the plants, the result of twenty years of careful cultivation, was once exhibited at a meeting of the Massachusetts Horticultural Society for a prize offered for the best specimen plant. The prize went to some quick-growing, foliage stove-plant with a spot or a band which had not been noticed in any of its like, the Committee hardly considering the forgotten Australian shrub worth notice. Mr. Atkinson never will forget this incident, or lose an opportunity to repeat it. There are fine old plants of some of the old-fashioned Azaleas, like Decora. Heaths are well done and so are Chorizemas, of which a large collection is grown. Here I saw, too, for the first time in America, a plant of *Anopteris glandulosa*, a native of Van Diemen's Land. It is a member of the Saxifrage family, with handsome evergreen foliage and erect racemes of white or rose-tinted flowers.

These gardens are famed for their Japan Irises and for the great masses of spring-blooming shrubs and bulbous plants.

Hinsdale, Mass. *F. S.*

Injuries to Conifers.

To the Editor of Garden and Forest:

Sir.—During several weeks past many observers have been noticing the large number of twigs of Norway Spruce that have been scattered on the ground about the trees. In a number of instances red squirrels have been seen on the limbs cutting the young twigs, from which they usually take the buds, and perhaps a part where the twig was severed. It was interesting to notice the varied replies to questions put to people who had seen the twigs on the ground. The twigs come off too hard to warrant the conclusion that they separate spontaneously. Most of them look as though they had been pulled or torn off, and not cut smoothly, although the squirrels caused the mischief. The twigs preferred are those that made short growths last year. Examination reveals the fact that this kind of work has been going on for some years at this place, and some persons remember to have observed this twig-cutting in former years.

Our squirrels here have no difficulty in reaching any part of the trees, even to the ends of slender twigs. In a very few instances the Scotch Pines have suffered in the same manner as the Spruces.

Agricultural College, Mich. *W. J. Beal.*

To the Editor of Garden and Forest:

Sir.—Since writing in regard to possible causes regarding the injury of Norway Spruces, I have found, experimentally, that a high wind alone, unattended by frost, is sufficient to produce the damage. If you will take hold of a branch of the Spruce and give it a sharp shake, you will strew your lawn with broken twigs of all sizes. Your shake does not need to be any stronger than that produced by a sudden gust of wind. We had quite a strong wind (north-west) last week, and I found a considerable number of twigs, all freshly broken, on the north-west side. Spruces standing right behind, but protected against the north-west, had no twigs broken on the opposite (south-west) side, where the force of the wind was sufficiently checked.

Washington, D. C. *B. E. Fernow.*

Recent Plant Portraits.

Lourya campanulata, *Revue Horticole*, March 16: The type of a new genus of *Hæmodoraceæ*, near Peliosanthes, recently dedicated by Baillon to the head of the indoor department in the *Jardin des Plantes*. Lourya is a native of Cochin China, where other species of this genus have lately been discovered. It has the port and the general appearance of an Aspidistra, while the flowers which are borne in compact umbles close to the ground and at the base of the leaf-stalk, resemble those of the Lily-of-the-Valley, although nearly twice as large. The plant requires the temperature of the stove.

Marmodes luxatum, *Revue Horticole*, March 16, an admirable colored figure of this Mexican Orchid, which has long been known in gardens.

Lonicera fragrantissima and L. Standishii, *Gardeners' Chronicle*, February 23d.

Notes.

The Department of Agriculture has just issued a circular on "Arbor-Day Planting in Eastern States." It has been prepared by Mr. B. E. Fernow, Chief of the Forestry Division, and it gives excellent advice as to the treatment of trees before and after transplanting, and the proper method of planting.

An international Congress of Pomologists will be held in Ghent in the month of September next, and in connection with it a large fruit-show. In the same city an International Exhibition of Chrysanthemums will be open from November 23d to December 1st, in celebration of the centennial of the introduction of the plant into European gardens.

It is interesting to note that American methods of Rose-culture are attracting attention abroad. An account of several of our famous Rose-growing establishments was recently printed in the *Gardeners' Chronicle* (London), accompanied by practical explanations with regard to the processes which result in the production of their fine winter crops; and a similar chapter was published in the March number of *Gartenflora*.

It has been decided by the Park Commissioners of Brooklyn to devote from $200,000 to $250,000 in preserving and beautifying certain portions of the city lands which lie to the eastward of its streets. About seventy-five acres, eleven acres of which are occupied by the reservoir, will be laid out with walks, drives and play-grounds, and, including the slopes of the reservoir, will be suitably turfed and planted. Ultimately, it is thought that portions of the ground may be devoted to the erection of public buildings, but meanwhile they will be made as useful and attractive to the people as possible.

Thousands of acres have this year been planted with fruit-trees in those districts of southern California where the "land-boomer" recently set all the world mad with speculation. In the San Joaquin valley large numbers of new settlers have lately established themselves in colonies for the purpose of fruit-growing, dividing their land into twenty and forty-acre tracts. In San Diego county the acreage devoted to this industry is five times as great as it was a year ago, and in Los Angeles and many other counties it is one-third greater. And, moreover, the old "placer-mining" counties are rapidly transferring their attention to fruit, and it is now the richest crop of Tuolumne, for example, once a conspicuous centre of gold production.

For many years the prizes offered by the Massachusetts Horticultural Society have been open to all competitors, whether they were members of the Society or inhabitants of Massachusetts or not. Several months ago a few members, who are in the habit of exhibiting strawberries, finding that outsiders living in a neighboring state were carrying off the prizes from the home talent, quietly went to work and secured the adoption of an amendment of the constitution, restricting competition to members of the Society. The movement and the method by which it was carried out have been considered unfortunate by many members of the Society, and at its last meeting the matter was reconsidered, and the prizes, by a large vote, are again opened to the whole world.

At the Massachusetts Experiment Station the black knot on Plum trees has been treated with linseed oil, turpentine and kerosene. These remedies were applied with a brush as soon as the warts began to appear, and as they do not all come at once, applications were made three times during the summer, all the warts being painted over each time. In the autumn, microscopic examinations found no spores in the warts, in fact, none of the sacks (perithecia) were developed enough to produce spores before the warts were destroyed by the remedies. Where kerosene and turpentine were applied so liberally as to spread about on the branch and run down over it, the branch was killed. No such injury came from using the linseed oil. The warts should be saturated in every case. The treatment of black knot hitherto recommended was cutting off the diseased branch and burning it. If this dangerous fungus can be controlled by any less heroic treatment it will be a great gain to plum growers.

At the late exhibition in Ocala, Florida, a scale of 100 points was used for judging oranges. Ten points were given each of the following characters, the first five being grouped as "physical" and the second five as "juice" characters: (1) size, (2) appearance, (3) thickness of peel, (4) absence of tissue or "rag," (5) absence of seed, (6) juiciness, (7) sweetness, (8) sub-acidity, (9) vinous flavor or bouquet, (10) absence of free acid. The standard of perfection for thickness of peel, absence of seed, and absence of tissue, was a full one-sixteenth inch peel on a 200-size, seedless orange, with a one-fourth inch core. An orange which sank in water scored ten for weight, that is, for juiciness. Every seed shown counted half a point off, and two rudimentary seeds counted for one. The unanimity of the tasters was remarkable, showing that the four different elements in estimating the quality of the juice were not fanciful distinctions. Several individual oranges under this rigorous test scored ninety-seven and a half.

Pinus Jeffreyi is well figured in the number of the *Gardeners' Chronicle* published on March 23d; the male flowers for the first time. It is one of the few California Conifers which grows satisfactorily in the eastern States, and those persons who have seen the handsome group of this tree in the park at Buffalo will hardly endorse the opinion expressed in our English contemporary "that a well-grown *Pinus ponderosa* is a very handsome object, the best *P. Jeffreyi* that I have seen is scarcely an ornament." As the two trees are seen here the latter is in every way the more satisfactory. As it appears on the eastern slopes of the Sierra Nevada, where this species abounds, and on Scott's Mountain, in northern California, where it was first discovered by the collector whose name it commemorates, *Pinus Jeffreyi* is certainly one of the handsomest of the family, as it is one of the largest, being surpassed in size only by *Pinus Lambertiana* and by occasional specimens of *P. ponderosa*, grown in favorable situations on the west or moist side of the California mountains.

A large picture of the conservatory at Castle Ashby, in Northamptonshire, the seat of the Marquis of Northampton, was recently published in the *Gardeners' Chronicle* (London). It is interesting to American horticulturists as showing a conservatory of a kind which has few examples in this country. It is a so-called "architect's conservatory," built for architectural effect rather than for practical efficiency. "It is a place of handsome proportions and good workmanship, and an ornament to the grounds, but the gardener abominates it, for do not his best plants lose their leaves and lower branches and become attenuated objects of no decorative value, often falling a prey to insect enemies?" It was designed by Sir Digby Wyatt, and is 140 feet in length by thirty feet in width. The roof is of glass, sloping up to a ridge in the middle, and in the centre of the house it rises into a dome forty feet in height. But the lofty walls are solid, and a double row of columns, supporting iron girders, runs the entire length of the house. These columns are monoliths of Bath-stone, with rich capitals in the Composite style; and however great the practical disadvantages of such an interior may be, it has great beauty of effect, the columns composing admirably with the tall Palms and Bananas that are most conspicuous among the plants.

A correspondent of a German horticultural journal recently called attention to the fact that the current love for Orchids and ornamental foliage-plants has led to the neglect of those great collections of Orange-trees which were once so highly esteemed in the Fatherland. Fifty years ago every royal and princely establishment had its Orangery—a large building of fine architectural aspect, filled in winter with a mass of Orange and Lemon trees, which in summer were set out in ornamental boxes in the pleasure-garden, and at all seasons could be transferred to the palace itself if an occasion of ceremony required its adornment. These trees were often of great age and enormous size, and to keep them in proper shape and bring them into profuse bearing was the chief task of the gardener. Now, however, they have fallen out of favor to such a degree that an Orangery most often presents but a forlorn and neglected appearance. One can well understand why the writer from whom we quote should protest against such a state of things and should ask whether it might not be possible, by means of some "congress or exhibition" to excite renewed interest in these historical collections. There are, indeed, few green-house plants which can vie in beauty with well-grown Orange-trees in full bloom or fruit, and their presence is almost essential to the right effect of a garden designed in the old architectural way.

The sales of plants at auction began a fortnight ago at the rooms of Young & Elliot, in this city, and will be held every Tuesday and Friday until the 1st of June or later. Fair prices have thus far been realized, although the demand for bedding-plants will be more brisk later in the season, when as many as 50,000 are often disposed of in a day. They are offered in lots of 100 or 50, ready packed for transportation, and are bought largely by country florists, who grow them on and sell them at retail. Small plants of Verbena, Lobelia and the like are often disposed of for a dollar or so a hundred. But, besides this cheap material, more expensive plants, like Palms, Dracænas and Crotons, some of them fine specimens, are often sold. Large importations of Roses and ornamental trees, shrubs and vines have already been disposed of. The latter are often in assorted lots, each containing five varieties. In a lot of twenty bundles, for example, each bundle will contain a Golden-leaved Elder, a Red-flowering Horse-chestnut, a Chinese Lilac, a double pink Deutzia and a purple Hazel. In each of a dozen other lots the selection will be entirely different. Finely-grown specimens of Tree-box, four or five feet high, with many Ghent Azaleas, Rhododendrons and the rarer Conifers, were on the list last Friday. Besides dealers in plants, many persons with large places find it profitable to make purchases here. Altogether, these auction-rooms, on sale-days, are never without their attractions, and visitors to the city who take an interest in plants should not fail to look in.

Catalogues Received.

Hulbert Fence and Wire Co., 904 Olive Street, St. Louis, Mo.;—Fencing, Wire-work, etc.—Fred. W. Kelsey, 208 Broadway, N. Y.;—Hardy Trees, Shrubs, Roses and Plants.—Wm. Paul & Sons, Waltham Cross, Herts, England;—Roses, etc.